

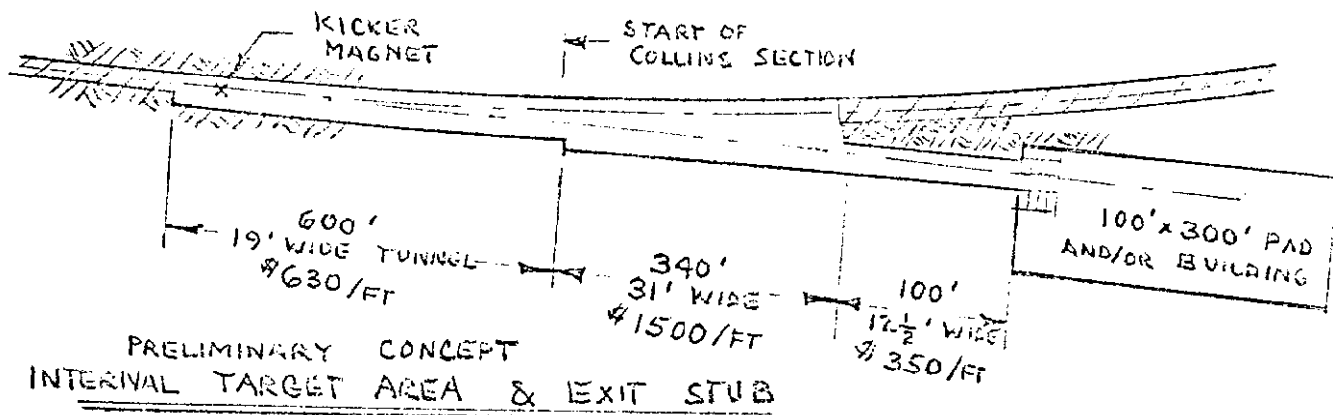
PRELIMINARY APPROXIMATION

COST OF INTERNAL TARGET AREA, EPB STUB, AND EXPERIMENTAL HALL

W. W. Salsig, Jr.

7-13-67

- A) INTERNAL TARGET AREA - Compare to "minimal" internal area case LRL Summer Study UCRL 16830, Vol. 3, page 53.



- 1) Tunnel Structure

$$600 \times \$630 + 340 \times \$1500 + 100 \times \$350 = \\ \$378,000 + \$510,000 + \$35,000 = \$923,000$$

- 2) Portable Shielding (UCRL-16830, Vol. 3, p 58) 200,000

- 3) Retaining walls, slab, earthwork

Assume this item to be the difference between the "minimal" and "super period" case costs - UCRL-16830 Vol. 3, p. 58

$$\$1,670,000 - \$510,000 = 1,160,000$$

- 4) Cranes (pair of 20 ton cranes with 5 ton aux hoists in main tunnel)

$$\begin{array}{r} 75,000 \\ 2,358,000 \\ \hline 700,000 \end{array}$$

12 1/2% A & E + 15% Contingency (i.e.  $\times .3$ )

TOTAL Internal Target Region and EPB stub  
(Includes 100'  $\times$  300' outdoor slab,  
but no building or crane over slab) \$3,060,000

B) MINIMUM CASE - EPB STUB ONLY (No exit tunnel, retaining walls or outdoor slab)

Tunnel Structure	\$378,000 + \$510,000 (From A, item 1)	\$888,000
Pair of 20 ton cranes		60,000
Earthwork		

$$\text{Ave for ring} = \frac{\$4.5 \times 10^6}{20,600 \text{ ft.}} = \$210/\text{ft}$$

Add 50% more for EPB = \$300/ft × 980 ft	280,000
	<u>\$1,128,000</u>

A & E + Contingency (X.3)	340,000
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TOTAL EPB Stub Only	\$1,470,000
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COST OF INTERNAL TARGET AREA EPB EXIT AND OUTDOOR EXPERIMENTAL HALL

7-14-67 As another alternate, Dr. Goldwasser wants to include Experimental Hall (otherwise called High Bay Staging Area) plus 50 ton overhead crane.

Internal Target Area (From Page 1)	
Including only 100 × 300 slab outside	\$3,060,000

1) Exp. Hall 100 × 300 = 30,000 ft <sup>2</sup>	\$1,050,000
Cost @ \$35/ft <sup>2</sup> =	\$1,050,000
(Includes house utility but not exp area power & cooling)	

2) 100 ft span 50 ton crane with 10 ton aux hoist	125,000
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3) A & E + Contingency (X.3)	<u>340,000</u>
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1,470,000

TOTAL - Internal Target Area with 100' × 300' Experimental Hall outside of shielding	<u>\$4,500,000</u>
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Basis For 31' Wide Tunnel CostFirst Approach

System constructed by branch tunnel and main tunnel forms used in common for 31' wide section. Extra cost will be for 31' span of roof. Assume cost =  $(19' \text{ tunnel} + 12\frac{1}{2}' \text{ tunnel}) \times 1\frac{1}{2}$   
 $(\$630/\text{ft} + \$350/\text{ft}) 1.5 = \approx \$1500/\text{ft}$

Second Approach

Scale down from Eagling's estimate for "underground" interior area. (UCRL 16830, Vol. 3, page 58)

"Cavern" width from 70 to approximately 100 ft. wide  
 use 85' average width 400 ft. long  
 Cost \$3.7 million assume practically all in "cavern" structure.

Assume cost will vary as square of the span:

$$\begin{aligned} \text{For 31 ft. width} &= \frac{\$3.7 \times 10^6}{400 \text{ ft}} \left( \frac{31}{85} \right)^2 \\ \text{cost/ft} &= \$9.3 \times 10^3/\text{ft} (.133) = \$1230/\text{ft} \end{aligned}$$

USE \$1500/ft for zero order est.

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